

a⁷ movement as the conveyor and to return the control arm in the reverse direction to said one direction back across the top surface of the conveyor to the start position once the objects have been inserted into the cartons.--

R E M A R K S

The specification has been amended as needed so as to place this application in condition for disposal at the time of the next Official Action.

Amendments to the specification take care of the formal matters raised by the Examiner.

Claim 1 has been amended as needed to sharpen its definition of the invention relative to the cited references. Accordingly, reconsideration is respectfully requested, for the rejection of the claims as unpatentable over LANGEN et al. 4,936,077.

There is a critical difference between the current invention and the device shown in LANGEN et al. The device of the invention acts to move a number of pushers carried on a single control arm across the conveyor in a diagonal direction, as indicated by the direction line 7 in the drawings. The control arm is then moved back over the top of the conveyor in the reverse direction so that a new sequence can be started.

In LANGEN et al., pusher arms are reciprocated across the conveyor means of an angled track and then moved back again

across the conveyor, whilst still moving in the forward direction of the conveyor. The specification states at lines 26 to 29 of column 6 that the conveyor 41 acts to return the pusher assembly to the separating station 14 so that the process can be repeated. The only feasible way in which the conveyor 41 can return the pusher assembly to the load separating station is by carrying the parts of the pusher assembly down and under the parts shown in plan view in the drawings and back in the reverse direction to the separating station.

An assembly of this nature, which requires operating arms of the pushers to be moved back off the conveyor and then carried round underneath the support assembly is just what the present invention aims to avoid. That construction is cumbersome and requires substantial space to one side of the main conveyor for the pusher assembly and its operating parts. In contrast, the invention operates to move the pushers across from one side of the conveyor to the other and then return the pushers back across the top of the conveyor to the one side of the conveyor along the reverse path for a further operation. The neatness of this assembly can readily be seen just by comparing Figure 1 of this invention with Figure 2 of the LANGEN et al. patent.

In order to bring out clearly the distinction between these two proposals, claim 1 has been amended to clarify the working of the device of this invention. The key part is reference to return of the control arm in the reverse direction

across the top surface of the conveyor. This reverse movement essentially mirrors the forward movement, which achieves a very compact movement assembly, although, as in claim 3, the pusher arm might be raised for its return journey.

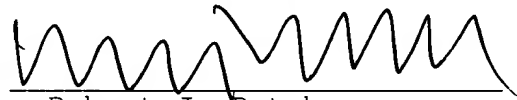
In view of the present amendment and the foregoing remarks, therefore, it is believed that this application has been placed in condition for allowance, and reconsideration and allowance are respectfully requested.

Attached hereto is a marked-up version of the changes made to the specification and claims. The attached page is captioned "VERSION WITH MARKINGS TO SHOW CHANGES MADE."

Respectfully submitted,

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VERSION WITH MARKINGS TO SHOW CHANGES MADE

Page 2, the paragraph beginning on line 27, bridging page 3, has been replaced as follows:

--The device shown in the drawings incorporates a conveyor 1 on which are carried (for example) individual food trays 2 which are to be inserted into open ended cartons 3. As the conveyor 1 moves (from right to left as shown in Figure 1) the cartons 3 move at the same speed with the conveyor. A robotic support body 4 incorporates a control mechanism arranged to move the support body about suitable rotational axes so as to cause a control arm 5 to be moved across the conveyor 1. The arm 5 incorporates paddles 6 which engage with the trays 2 so as to push the trays towards the cartons 3. The arm 5 is moved across the conveyor 1, but at the same time moves from right to left at the same speed as for the conveyor 1. the diagonal path taken by a head [11] 9 of the support body, carrying the arm 5, is indicated by the broken line 7 as shown in Figures 2 and 3. This results in the trays 2 being pushed fully home into the cartons 3. The arm 5 is then raised and the head [11] 9 is brought back along the reciprocal path 8 (as shown in Figure 4) until the arm returns to and is lowered into the start condition as shown in Figure 1. The same operation can then be employed to move another set of four trays into a subsequent series of four cartons.--

Page 3, the paragraph beginning on line 21, bridging page 4, has been replaced as follows:

--The paddles 6 could be designed to be disengaged appropriately in instances where it is not practical to [lad] load the trays into the carton, a monitoring device has sensed that there is an oversize product or a badly formed carton. The robotic arm 10 can be fitted with customised gripper attachments to facilitate stacking or tiering of products prior to loading the products into the cartons. The paddles can incorporate a facility to apply downwards or sideways pressure onto the top of the product to ensure that it enters the carton aperture.--

Claim 1 has been amended as follows:

--1. (amended) A carton filling device comprising a conveyor having a top surface and provided for moving cartons and objects to be located in the cartons simultaneously down a track with the objects respectively facing opposite to open ends of the cartons located at one side of the conveyor, and a single control arm situated in a start position at the other side of the conveyor and carrying at least two ^{MULTIPLE of PARTS} pushers for engaging the objects and pushing them towards and into the open ends of [the] separate cartons under control of a control mechanism adapted to move the control arm in one direction not only across the conveyor, but also down the conveyor at the same speed of movement as the conveyor and to return the control arm in the reverse direction to said one direction back across the top

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surface of the conveyor to the start position once the objects
have been inserted into the cartons.--